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ENDANGERED SPECIES

Technical Bulletin

U.S. Department of the Interior
Fish and Wildlife Service

New Legislation Aids the Recovery of Endangered Fish and Refuge Wetlands in Nevada

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Division of Habitat Conservation
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In virtually the closing moments of the 101st legislative session in November 1990, Congress enacted a new law intended to help recover two listed fishes and restore National Wildlife Refuge wetlands in Nevada vital to migratory waterfowl and shorebirds using the Pacific Flyway.

In addition to its progressive strategies for fish and wildlife, Public Law 101-618 confronts many long-standing water problems in the Truckee and Carson River basins of western Nevada: allocation of water between California and Nevada, coordination of water storage in Federal and private reservoirs, water management at one of the first Bureau of Reclamation irrigation projects, and resolution of certain Indian water rights disputes. Most significant for the conservation of endangered species and wetlands is a new directive to acquire water rights expressly for fish and wildlife. The purchase of water at market rates should encourage the voluntary reallocation of water resources to benefit fish and wildlife in a manner that is equitable and most likely to enjoy local support.

Although the new law directly resolves only a few outstanding issues, it creates momentum for solutions and a framework within which remaining disputes will be considered. While several earlier bills failed for lack of either local or Federal support, PL. 101-618 establishes the intent of Congress, and signals the com-

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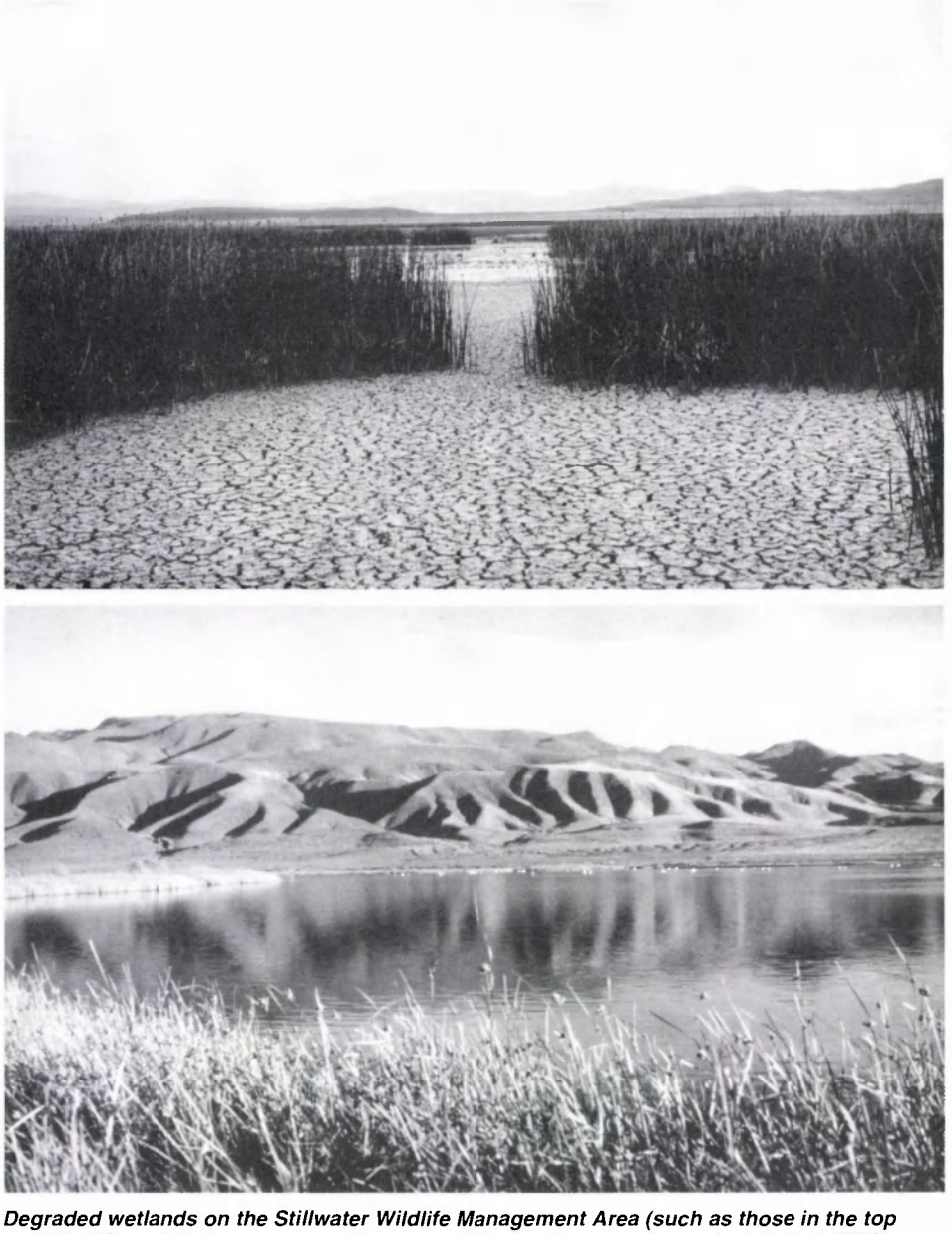

Fish and Wildlife Service photos

Degraded wetlands on the Stillwater Wildlife Management Area (such as those in the top photo) will receive new water purchased under authority of the recent legislation. Millions of migrating waterfowl and shorebirds will benefit.

Regional News

Regional endangered species staffers have reported the following news:

Region 1 - Researchers who completed a fall survey of the mainland California population of southern sea otters *(Enhydra lutris nereis)* in November have no immediate explanation for why numbers of this marine mammal increased only slightly from the year before. The 1991 count of 1,661, not as high as we were hoping to see, was up 1.5 per cent from the 1990 count of 1,636. The average annual increase in fall populations is about 2.5 per cent.

* * *

Airport displays planned for Hawaii, Guam, and the Republic of Palau will alert travelers to the impact of wildlife trade and provide a distribution point for a new brochure in English and Japanese about this important issue. Developed collaboratively by staff members in the Service's Pacific Islands Field Office and the Portland Regional Office, including Law Enforcement, the brochure will also be distributed in the Commonwealth of the Northern Mariana Islands, American Samoa, and foreign ports and embassies frequented by visitors to U.S. Pacific islands. The brochure is a positive step for wildlife conservation throughout the Pacific Basin. The Pacific Islands Office has sent copies to field offices in Region 1 and has more available.

* * *

Region 2 - Red-cockaded woodpeckers *(Picoides borealis)* have declined as much as 75 percent in the McCurtain County Wilderness Area of Oklahoma, according to biologists from the Oklahoma Department of Wildlife Conservation, who searched 11,366 acres (4,600 hectares) of the area between 1989 and 1990.

The 15 red-cockaded woodpecker clans located represent a dramatic decline from 1977 when a survey of 83 percent of the same area resulted in the discovery of 29 clans. Clans declined 62 percent (from 29 to 15), and the number of birds decreased 74-76 percent (from 86-92 to 22). Within the resurveyed areas, only 3 of 22 clusters of cavity trees (active and abandoned) were more than 437 yards (400 meters) from a cluster that was active in 1977, indicating a low rate of colonization of new areas. Productivity of the population was low during the study period; an average of only 0.69 young were fledged per nesting attempt. Linear regression was used to examine the

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U.S. Fish and Wildlife Service Regions

Region 1: California, Hawaii, Idaho, Nevada, Oregon, Washington, American Samoa, Commonwealth of the Northern Mariana Islands, Guam, and the Pacific Trust Territories. **Region 2:** Arizona, New Mexico, Oklahoma, and Texas. **Region 3:** Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin. **Region 4:** Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Puerto Rico and the U.S. Virgin Islands. **Region 5:** Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia. **Region 6:** Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming. **Region 7:** Alaska. **Region 8:** Research and Development nationwide. **Region 9:** Washington, D.C., Office.

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Bald Eagle Numbers Continue to Rise

Charles G. Kjos
Endangered Species Biologist
Twin Cities Field Office

The bald eagle *(Haliaeetus leucocephalus),* currently listed as Endangered or Threatened in the lower 48 States, continues its steady improvement. The reported number of known nesting territories in 1990 was 3,014, up from 1,188 less than a decade ago. This encouraging news is contained in survey results for the 1990 nesting season reported to the Fish and Wildlife Service.

Surveys of occupied bald eagle territories and productivity are funded and conducted by a variety of Federal and State agencies, independent organizations, and individuals. Results for each of the five Bald Eagle Recovery Regions are presented in the following table. Typically, two separate surveys are conducted. Occupied territories, defined as those where surveyors noted eagle activity early in the breeding season, are counted first. To avoid interference with breeding success, surveys of such territories are frequently conducted before the eggs are laid or the young hatch. The second survey counts young in the later stages of the nest cycle. Figures for young per occupied territory are reached by dividing the number of young actually counted on the second survey by the number of occupied territories counted on the first survey.

1990 Bald Eagle Breeding Survey Results

RECOVERY REGION	ESTIMATED OCCUPIED TERRITORIES	ESTIMATED AVERAGE YOUNG PER OCCUPIED TERRITORY
Chesapeake		
Delaware	6	1.17
Maryland	115	1.43
New Jersey*	4	1.25
Pennsylvania*	4	1.25
Virginia*	104	1.43
West Virginia	2	2.50
	Total = 235	Est. young/occ. terr. = 1.40
Northern		
Colorado	10	1.30
Connecticut	1	0.00
Illinois	8	0.88
Indiana	2	0.00
Iowa	8	1.63
Kansas	2	2.00
Maine	123	0.80
Massachusetts	5	0.80
Michigan	174	0.90
Minnesota	437	1.07
Missouri	4	2.00
Nebraska	1	0.00
New Hampshire	1	2.00
New Jersey*	0	0.00
New York	13	1.15
North Dakota	1	2.00
Ohio	16	0.75
Pennsylvania*	3	1.33
Rhode Island	0	0.00
South Dakota	0	0.00
Utah	2	1.00
Vermont	0	0.00
Virginia*	0	0.00
West Virginia*	0	0.00
Wisconsin	358	0.99**
	Total = 1,169	Est. young/occ. terr. = 1.00

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Bald Eagle Numbers

(continued from page 3)

RECOVERY REGION	ESTIMATED OCCUPIED TERRITORIES	ESTIMATED AVERAGE YOUNG PER OCCUPIED TERRITORY
Pacific		
California*	93	1.06
Idaho	53	1.36
Montana	93	1.40
Nevada	0	0.00
Oregon	175	0.92
Washington	398	1.06
Wyoming	49	1.24
	Total = 861	Est. young/occ. terr. = 1.10
Southeast		
Alabama	4	0.00
Arkansas	10	0.60
Florida	535	1.09
Georgia	8	1.63
Kentucky	7	0.86
Louisiana	45	1.38
Mississippi	3	0.67
North Carolina	7	1.29
Oklahoma*	0	0.00
South Carolina	59	1.05
Tennessee	15	1.00
Texas*	29	1.00
	Total = 722	Est. young/occ. terr. = 1.10
Southwest		
Arizona	26	0.54
California*	0	0.00
New Mexico	1	0.00
Oklahoma*	0	0.00
Texas*	0	0.00
	Total = 27	Est. young/occ. terr. = 0.54

Estimated Grand Total = 3,014 Occupied Territories

* A recovery region boundary cuts through this State; parts of the State are in different recovery regions. Productivity estimates are for the portion of the State in the indicated recovery region.

** (Est. based on MI/MN ave. -no 1990 hatching data for WI)

Regional News

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relationship between foraging habitat quality and distance from the nearest active clusters. The distance from the sample points to the nearest active cluster did not explain a large portion of the variation in any of the vegetation variables for pines or hardwoods.

Overall, foraging habitat in the McCurtain County Wilderness Area meets requirements established in the 1985 Red-cockaded Woodpecker Recovery Plan. Biologists compared habitat at 18 active red-cockaded woodpecker cavity trees (cluster sites) and 18 paired non-use sites. The area surrounding active cavity trees (0.09 acres or 0.04 ha) had significantly shorter hardwoods and less hardwood basal area than non-use sites.

* * *

In 1990, searches of areas in Oklahoma where isolated groupings of vireos have been observed since 1985 located black-capped vireos *(Vireo atricapillus)* in only two—the Salt Creek site in Blaine County and a site near Scott in Caddo County. Thirteen adult vireos were located, including six females. Five of the 6 females present in Blaine County produced 17 young. No females were seen at the Scott site. To reduce nest parasitism, the Oklahoma Nature Conservancy initiated a cowbird *(Molothrus ater)* trapping program at the Blaine County site. At the very beginning of the trapping period, cowbirds parasitized two of six vireo nests with complete clutches. Three of six male vireos and one of three females banded in 1989 returned to the site in 1990. Overall, one-year detected returns for these isolated groupings are 48 percent (14 of 29) for males and 47 percent (7 of 15) for females.

* * *

Billy Dale Inman and Curtis Collier Sayers of Marble Falls, Texas, were sentenced by U.S. Magistrate Stephen Capelle of Austin, Texas, for killing an Endangered whooping crane *(Grus americana)*. Inman was sentenced on October 25, 1991, to serve 60 days in a Federal facility, pay a $10,000 fine, perform 200 hours of community service, and be placed on 5-year probation. Inman also forfeited his gun. Sayers, who pleaded guilty to aiding in the killing, was sentenced on November 4 to 20 days in a Federal facility, fined $2,000, ordered to perform 200 hours community service, and placed on a 3-year probation. Inman and Sayers were also required to share in paying $8,100 in civil damages to the State of Texas for killing the bird.

Inman pleaded guilty to shooting the adult female whooping crane with a 12-gauge shotgun during a fishing trip on April 15, 1991. He and Sayers were fishing along the Colorado River near Bend, Texas, 75 miles (120 kilometers) north-

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Listing Proposals — November/December 1991

Thirty-seven species — 21 animals and 16 plants — were proposed by the Fish and Wildlife Service during November/December 1991 for listing as Threatened or Endangered. If the listing proposals are approved, Endangered Species Act protection will be extended to the following:

Mexican Spotted Owl *(Strix occidentalis lucida)*

The Mexican spotted owl, one of three recognized spotted owl *(Strix occidentalis)* subspecies, is a medium-sized bird that inhabits parts of the southwestern United States and northern Mexico. Like its relative the northern spotted owl *(S. o. caurina),* which inhabits mature forests in the Pacific Northwest, the Mexican spotted owl is believed to be in danger from the loss or fragmentation of its forest habitat. On November 4, the Service proposed to list the Mexican spotted owl as a Threatened subspecies.

Mexican spotted owls are found in a region extending from the southern Rocky Mountains in Colorado and the Colorado Plateau in southern Utah, southward through Arizona and New Mexico, and (discontinuously) through the Sierra Madre Occidental and Oriental to the mountains at the southern end of the Mexican Plateau in the state of Michoacan. Within this region, they primarily occur at forested mountain and canyon sites with dense, uneven-aged stands, high canopy closure, numerous snags, and a heavy accumulation of downed woody material. Habitats with these qualities are best expressed in mature mixed-conifer and pine/oak forests, although younger forests can be used if enough large trees remain. Historical records indicate that spotted owls once ranged into low-elevation riparian woodlands as well; however, much of this habitat has disappeared. Arizona, for example, has lost more than 90 percent of its low-elevation riparian habitat since the mid-1800's.

As of 1990, spotted owl records for the southwestern U.S. and Mexico totalled 291 known pairs and 198 singles. Based on sighting reports, the amount of suitable habitat, and survey results, the Service estimates there are 806 pairs of Mexican spotted owls and 548 singles in the U.S., for a total population of 2,160 birds.

There are not enough data to make an accurate estimate of the population in Mexico, but the threats to spotted owl habitat there are considered serious. Mexican forestry programs receive little or no government funding; instead, they depend for their budgets on what they can collect from logging. Sustained yield forestry and reforestation are not being emphasized, and the outlook is for accelerated deforestation. A proposal financed by the World Bank and aimed at the Copper Canyon region of western Chihuahua would extract more than 4 billion board feet of lumber from nearly 20 million acres (8.09 million hectares) over 6.5 years.

In the U.S., the Fish and Wildlife Service estimates there are currently 5.3 to 5.6 million acres (2.1 to 2.3 million ha) of suitable Mexican spotted owl habitat, most of which is on public land. However, not all of the suitable habitat is known to be occupied by spotted owls. About 91 percent of the known owls occur on national forests, 4 percent occur on national parks, 4 percent occur on Indian reservations, and 1 percent occur on Bureau of Land Management lands. The current management of these lands varies by agency. Of the estimated suitable Mexican spotted owl habitat in Arizona and New Mexico national forests, approximately 60 percent is managed for commercial timber production. At present, 95 percent of these timberlands are managed by the shelterwood system, which results in even-aged regenerated stands. Thus, the uneven-aged, multistoried forests comprising primary owl roost and nest sites will be converted to unsuitable even-aged stands with reduced habitat diversity.

Forest fires also threaten the Mexican spotted owl. About 220,000 acres (89,000 ha) of suitable spotted owl habitat in Arizona and New Mexico have burned in recent years. In addition to direct habitat loss by logging and fire, habitat fragmentation makes spotted owls more vulnerable to predation. Hawks and great horned owls *(Bubo virginianus),* which favor "open" forests, are suspected to be a significant threat to Mexican spotted owls.

If the Mexican spotted owl is listed as Threatened, Federal agencies will be responsible for ensuring that activities they fund, authorize, or carry out — such as logging, mining, and road construction — are not likely to jeopardize the bird's survival. A designation of critical habitat was not proposed in this case on the grounds that it would not provide significant additional benefits to the owl.

Oregon Chub *(Oregonichthys crameri)*

A small freshwater fish, this species once inhabited sloughs, oxbows, overflow ponds, and other backwater habitats throughout the Willamette River drainage in Oregon. After extensive habitat alteration, however, established populations are known to survive in only about two percent of the former distribution. Because of threats to the remaining fish, the Service proposed on November 19 to list the Oregon chub as Endangered.

The most severe decline of this species was in the 1950's and 1960's, when 8 of the 11 flood control projects in the Willamette River basin were completed. Other activities, such as revetment and channelization, diking and drainage, and the removal of floodplain vegetation may also have destroyed or altered the slack water habitat favored by the Oregon chub. Threats to the remaining habitat include siltation from logging and construction, water pollution, unauthorized filling, and changes in water levels or flow conditions. The Oregon chub is further

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Listing Proposals

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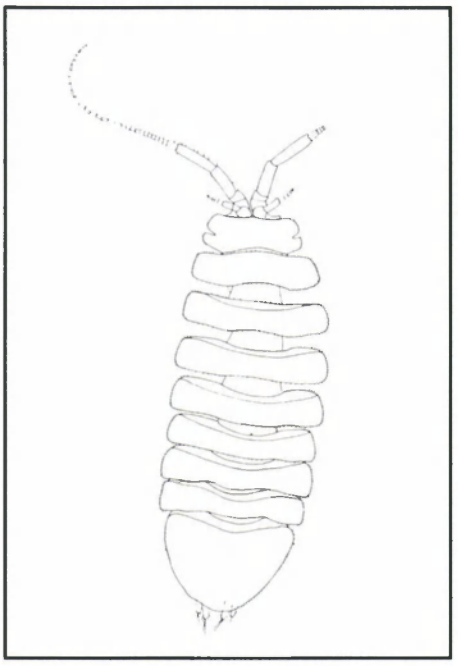
threatened by predation and competition from introduced populations of non-native fish species.

The only established populations of the Oregon chub known to remain are restricted to a 19-mile (30-kilometer) stretch of the Middle Fork Willamette River in the vicinity of Dexter and Lookout Point Reservoirs in Lane County, which are operated by the U.S. Army Corps of Engineers (COE). There is public pressure to increase sport fishing opportunities at these impoundments by stocking additional species of large, non-indigenous game fish, which could jeopardize the remaining Oregon chubs. Additionally, both reservoirs are near rail, highway, and power transmission corridors. They are therefore vulnerable to pollution from runoff of herbicides used for right-of-way maintenance and chemical spills from truck or rail accidents.

Small numbers of Oregon chubs (one to four fish) also have been observed in recent years in the lower North Santiam River, which forms the boundary between Linn and Marion Counties, and in Gray Creek within the William L. Finley National Wildlife Refuge in Benton County. The size and viability of these potential populations remains unknown. As a precaution, Finley Refuge managers have begun to moderate the use of agricultural chemicals in the Gray Creek drainage and have ceased beaver dam removals where the chub may be affected.

Lee County Cave Isopod *(Lirceus usdagalun)*

Named *usdagalun,* the Cherokee word for "cave" or "hole under rock," this small freshwater crustacean lives only in underground streams and lacks both eyes and pigmentation. It was known originally from two cave systems in Lee County, Virginia, but was eliminated from one system when the groundwater was polluted by a nearby sawmill. The remaining population is vulnerable to several development projects under consideration. For this reason, the Service has proposed



drawing by John R. Holsinger

Lee County cave isopod

to list the Lee County cave isopod as Endangered (F.R. 11/15/91).

Two major development projects of concern are an airport and a prison facility proposed for construction in the vicinity of the isopod's last known population. Some of the development options under consideration would locate these facilities over or adjacent to large sinkholes leading into the cave system. As a result, sediments and other pollutants could enter the groundwater during the construction or operation phases. The Federal agencies with jurisdiction over these proposed projects, the Federal Aviation Administration and the Bureau of Prisons, are aware of the isopod's presence in the area. It is considered likely that, with proper planning, the facilities can be constructed without adversely affecting the species.

Kanab Ambersnail *(Oxyloma haydeni kanabensis)*

Emergency protection was given to the Kanab ambersnail on August 8, 1991, when the Service published a temporary (240-day) rule listing this small terrestrial mollusk as Endangered. A follow-up proposed rule to give the snail long-term protection as an Endangered species was published November 15, and the rule was made final April 17, 1991.

When the emergency rule was issued, the Kanab ambersnail was thought to exist at only two locations, both in an area of south-central Utah. One population was almost extirpated when its marsh habitat was altered to divert water for livestock. In an intensive 1990 survey, only three snails could be found at this site, which previously supported hundreds. A significant portion of the second population was destroyed recently by earth-moving equipment. The landowners would like to sell the property, but if they cannot do so quickly they have plans to develop the area, which would result in further habitat damage. Purchasing the site may be the only effective means of protection the population, and The Nature Conservancy is investigating this option.

Recently, the Service learned of a Kanab snail population in the Grand Canyon. This is encouraging news, but the total range and numbers for this species are still considered too small to ensure its long-term survival.

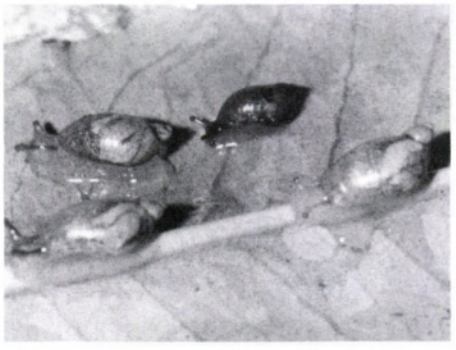


photo by Blaine Lunceford

Kanab ambersnail

Eleven Freshwater Mussels

Eleven species of freshwater mussels native to the Mobile River drainage in Alabama, Georgia, Mississippi, and Tennessee were proposed November 19 for listing as Endangered or Threatened:

- **upland combshell** *(Epioblasma metastriata)* - Endangered
- **southern acornshell** *(Epioblasma othcaloogensis)* - Endangered
- **Coosa moccasinshell** *(Medionidus parvulus)* - Endangered
- **southern clubshell** *(Pleurobema decisum)* - Endangered

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Listing Proposals

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- dark pigtoe *(Pleurobema furvum)* - Endangered
- southern pigtoe *(Pleurobema georgianum)* - Endangered
- ovate clubshell *(Pleurobema perovatum)* - Endangered
- triangular kidneyshell *(Ptychobranchus greeni)* - Endangered
- fine-lined pocketbook *(Lampsilis altilis)* - Threatened
- orange-nacre mucket *(Lampsilis perovalis)* - Threatened
- Alabama moccasinshell *(Medionidus acutissimus)* - Threatened

These mollusks are found on stable gravel and sandy-gravel substrates in high-quality, free-flowing streams and rivers. Their distribution has been reduced and fragmented considerably by widespread degradation and modification of the riverine habitat. None of these species are known to tolerate impoundments. More than 1,000 miles (1,699 km) of large and small river habitat in the Mobile River drainage have been impounded for various purposes. Impoundment projects can adversely affect riverine mussel species by killing mussels during construction and dredging, suffocating them with accumulating sediments, lowering their food and oxygen supplies, and locally extirpating the host fish that mussels parasitize during their larval stage. Several additional impoundment and stream channelization projects have been proposed for parts of the Mobile River drainage.

Water pollution also is harming these and other mussel species. Point sources include municipal and industrial effluents. Non-point sources, such as runoff from agricultural operations and coal mines, degrade water quality as well.

Another threat to these species is incidental take during the commercial harvest of mussels for their shell. Even mussels that are not used can be killed during the collection process when they are dislodged from their substrate. The small rivers and streams in which the above proposed mussels occur have not traditionally supported shelling operations, but a dramatic increase in the price of shell and increased competition is attracting commercial collectors to these areas.

If the listing proposal becomes final, Federal agencies responsible for water quality, and those involved in impoundment and stream channelization projects, will be required to take into account the potential impacts on these mussels.

Three African Antelopes

Three species of antelopes native to northern Africa were proposed November 5 by the Service for listing as Endangered:

- scimitar-horned oryx *(Oryx dammah)* - a large, rather heavy antelope standing about 47 inches (119 centimeters) at the shoulders and weighing around 450 pounds (204 kilograms). Its horns curve back in an arc and are up to 50 inches (127 cm) long.
- addax *(Addax nasomaculatus)* - a smaller animal, standing about 42 inches (106 cm) at the shoulder and weighing around 220 pounds (100 kg). Its horns twist in a spiral up to 43 inches (109 cm) long.
- dama gazelle *(Gazella dama)* - even smaller and more slender, standing about 39 inches (99 cm) at the shoulder and weighing around 160 pounds (72 kg). Its horns curve back and up, but reach a length of only about 17 inches (43 cm).

These antelope species occur in and around the Sahara Desert and the Sahel, a broad zone of semiarid grassland and savannah to the south. Each has declined drastically in recent decades because of habitat deterioration and excessive hunting. All three are already on Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), an international treaty to control the trade in vulnerable wildlife. They are also considered endangered or vulnerable by the International Union for the Conservation of Nature and Natural Resources (IUCN).

The establishment of vast herds of livestock in this arid region has eliminated wildlife forage by overgrazing, eroded the soils, and intensified the desertification that has been under way for several thousand years. Overhunting is another threat. These antelope species have traditionally been taken by local peoples for food and leather. A serious new problem, however, is the growing number of hunters from several Middle Eastern countries who, traveling in caravans of all-terrain vehicles and equipped with automatic rifles, have ignored local laws and devastated once large herds for sport.

Captive and free-roaming populations of these antelopes that are being maintained outside their natural range may be covered separately from natural populations in any final rule. Among the alternatives for such groups would be listing as Endangered, as Threatened (with special regulations), or "Threatened due to Similarity of Appearance" to animals from wild populations. The latter two classifications could allow for more management flexibility.

Giant Garter Snake *(Thamnophis gigas)*

As indicated by its name, this non-venomous reptile is one of the largest species of garter snakes, with a total length of at least 55 inches (140 cm). Its coloration is brownish on the back with a checkered pattern of black spots, separated by a yellow dorsal stripe and two lighter lateral stripes. Endemic to wetlands in the Sacramento and San Joaquin valleys of California, the giant garter snake inhabits sloughs, small lakes, low-gradient streams, canals, and certain other artificially maintained wetlands, where it feeds primarily on frogs and small fish. During its winter dormancy, this snake retreats to small mammal burrows above prevailing flood levels.

The extensive loss or fragmentation of valley floor wetlands and the higher elevation habitats that provide escape cover during floods are rangewide threats to the giant garter snake. It has been eliminated from many areas by agricultural development, urbanization, flood control projects, and perhaps the State's 5-year

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Listing Proposals

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drought. In addition to these continuing threats, non-native game fishes introduced for sport fishing prey on the young snakes and may be responsible for the absence of the species from some of the apparently suitable habitat that remains. On December 27, the Service proposed listing this species as Endangered. The giant garter snake is already listed by California as a threatened species under State law, and a Federal listing would provide additional protection.

The largest remaining population of giant garter snakes inhabits extensive agricultural lands in the American Basin, a large flood basin at the confluence of the Sacramento and American Rivers in Sutter and Sacramento Counties. A proposed COE project to provide 200-year flood protection for this agricultural land would likely result in conversion of the area to urban uses. Without adequate mitigation for loss of habitat, this important population could be lost. If the giant garter snake is given Endangered Species Act protection, the COE will be responsible for consulting with the Service to avoid jeopardizing the snake.

San Luis Obispo County Species

Six taxa — five plants and one snail — endemic to western San Luis Obispo County, California, were proposed December 23 for listing as Endangered:

- Morro manzanita *(Arctostaphylos morroensis)* - an attractive perennial shrub in the heath family (Ericaceae) that occurs within coastal maritime chaparral habitat around Morro Bay.
- Chorro Creek bog thistle *(Cirsium fontinale* var. *obispoensis)* - a short-lived perennial herb in the aster family (Asteraceae) primarily restricted to serpentine soil outcrops around San Luis Obispo.
- Pismo clarkia *(Clarkia speciosa* ssp. *immaculata)* - a delicate annual herb in the four-o'clock family (Onagraceae) growing on pockets of sandy soil within grassy openings in chaparral and oak woodlands.

photo by H. W. Meyer

Arctostaphylos morroensis

photo by M. McLeod

Eriodyction altissimum

- Indian Knob mountainbalm *(Eriodyction altissimum)* - an aromatic perennial shrub in the waterleaf family (Hydrophyllaceae) found within coastal maritime chaparral habitat around Morro Bay.
- California sea-blite *(Suaeda californica)* - a low-growing perennial succulent in the goosefoot family (Chenopodiaceae) occurring in coastal marsh habitat around Morro Bay.
- Morro shoulderband snail *(Helminthoglypta walkeriana)* - a medium-sized land snail restricted to coastal dune and sage scrub on the south end of Morro Bay.

The low numbers and restricted ranges of these species make them vulnerable to extinction from a variety of causes. Among the continuing threats to their habitat are urbanization, road construction and maintenance, cattle grazing, off-road vehicles, water developments, competition with non-native plants, and possibly dredging in Morro Bay.

Four Vernal Pool Species

Three plants and one species of fairy shrimp that occur only in vernal pools within southwestern Riverside County and western San Diego County, California, were proposed November 12 for listing as Endangered:

- Otay Mesa mint *(Pogogyne nudiuscula)* - a small, aromatic annual in the family Lamiaceae that produces whorls of bright purple flowers.
- California Orcutt grass *(Orcuttia californica)* - a short, pungent annual grass in the family Poaceae.
- San Diego button-celery *(Eryngium aristulatum* var. *parishii)* - an herb in the parsley family (Apiaceae) that is usually an annual but may persist as a perennial if conditions are favorable.
- Riverside fairy shrimp *(Streptocephalus woottoni)* - a small, newly described freshwater crustacean in the family Streptcephalidae.

All four species are endemic to vernal pools, an unusual type of habitat that forms in areas with Mediterranean climates where slight depressions underlain with an impervious soil layer fill with water after fall and winter rains. These seasonal wetlands, which dry during spring and summer months, are considered fragile, easily disturbed ecosystems. Vernal pools are being damaged or destroyed by urban and agricultural development, mowing and livestock grazing, off-road

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Listing Proposals

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vehicle use, trash dumping, and invasions of weedy, non-native plants. Populations of these species near the international border are even suffering the effects of foot traffic from people illegally entering the United States. In the San Diego area alone, approximately 97 percent of former vernal pool habitat has been destroyed by a variety of causes.

Vernal pools and other wetlands are regulated by the COE under section 404 of the Clean Water Act. If the listing proposal is approved, the COE will be responsible for ensuring that permits for the discharge of fill material into vernal pools will not jeopardize these species. Other Federal agencies whose activities may affect listed species also will be required to consult with the Service to avoid jeopardy. Further, vernal pools that occur on Federal lands (e.g., Camp Pendleton, Naval Air Station-Miramar) will receive additional protection.

Five Limestone-endemic Plants

Five taxa of plants endemic to calcium carbonate deposits (limestone and dolomite) in the San Bernardino Mountains of southern California were proposed November 19 for listing as Endangered:

- Parish's daisy *(Erigeron parishii)* - a small perennial herb in the family Asteraceae with deep rose to lavender flowers.
- Cushenbury buckwheat *(Eriogonum ovalifolium* var. *vineum)* - a low, mat-forming perennial in the family Polygonaceae bearing whitish-cream flowers that turn reddish or purple with age.
- Cushenbury milk-vetch *(Astragalus albens)* - a small, silvery-white perennial herb in the pea family (Fabaceae) with purple flowers.
- Cushenbury oxytheca *(Oxytheca parishii* var. *goodmaniana)* - a small, wiry annual in the family Polygonaceae.
- San Bernardino Mountains bladderpod *(Lesquerella kingii* var. *bernardina)* - a silvery perennial in the mustard family (Brassicaceae) with yellow flowers.

All five plants are found along a 35-mile (56-km) stretch of calcium carbonate (primarily limestone) outcrops along the northern, desert-facing side of the San Bernardino Mountains in pinyon/juniper woodlands. Most of the populations are within the San Bernardino National Forest, which supports a wide diversity of habitats. Although this unit of the national forest system constitutes less than 1 percent of the State's land area, it contains populations of over 25 percent of all plant species that occur naturally in California. Other habitat occupied by the recently proposed plants is administered by the Bureau of Land Management (BLM), on the lower, desert-facing slopes of the San Bernardino Mountains, and a few sites are privately owned.

Limestone mining is a serious threat to the five proposed plants. Because limestone is considered a "locatable mineral," deposits on Federal land are open to claim under the Mining Law of 1872. Virtually all of the limestone outcrops in the San Bernardino Mountains are under claim, and some are already being mined. The type of mining operation typically used in this area for limestone includes a large open or terraced pit, the roads on which the blasted rock is hauled to a processing plant, the processing plant itself, and the deposition of overburden (the material moved to reach the limestone). Other threats to these plant species include sand and gravel mining, gold mining, off-road vehicle use, and (for the bladderpod) the proposed expansion of a ski resort. If the listing proposal is approved, BLM and the Forest Service will be responsible for avoiding activities—such as approvals of mining plans and rights-of-way—that could jeopardize these species.

Applegate's Milk-vetch *(Astragalus applegatei)*

A perennial herb in the pea family, the Applegate's milk-vetch grows to about 1 foot (0.3 meter) in height and produces light purple flowers. This plant grows on flat, seasonally moist remnants of floodplain alkaline grassland in Oregon's Klamath Basin. Only four populations have been reported, one of which was apparently extirpated by agricultural development. Because of threats to the remaining populations, the Service proposed November 26 to list Applegate's milk-vetch as an Endangered species.

The last three known populations are in the vicinity of Klamath Falls. One is located on privately owned land and consists of a single plant. Another small site on State land supports 10 individuals. The largest population, which may be the only one that remains viable, numbered at least 1,000 plants on a 6-acre (2.4-hectare) site in 1985. A four-lane road built through the site has probably eliminated some plants and habitat, and another road may soon be under construction. The site is zoned for industrial and commercial development. If current land use patterns continue, this population —and consequently the species— may become extinct.

Because the site lies within a moist floodplain, it may be subject to treatment by the COE as a wetland under the Clean Water Act. If it does, and if the listing proposal is approved, the COE will be responsible for ensuring that any wetland fill permits it grants do not result in activities that jeopardize the species.

Smooth Coneflower *(Echinacea laevigata)*

A rhizomatous perennial herb in the aster family, the smooth coneflower grows to a height of about 4.5 feet (1.5 m). This plant has smooth stems, few leaves, and pink to purplish flowers. Its habitat consists of forest clearings, cedar barrens, roadsides, and other open areas on magnesium- and calcium-rich soils. Natural fires, as well as large herbivores, such as elk and bison, historically maintained habitat in the open condition needed by the coneflower.

A total of 58 smooth coneflower populations were reported historically from 8 States. Since the species' discovery, however, more than two-thirds of these populations have been lost, and the plant no longer occurs in the wild in Pennsylvania, Maryland, Alabama, and Arkansas.

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Thirty-nine populations were extirpated, partly as a result of the conversion of natural habitat for agriculture, silviculture, urbanization, and industrial development.

There are now 19 known populations of the smooth coneflower in North Carolina (6), South Carolina (6), Virginia (4), and Georgia (3), most of which are small. Three additional populations in South Carolina are believed to have been introduced. Eighteen of the 19 remaining natural populations are threatened by habitat loss or modification, and 11 are already declining. The largest population, which contains one-third of the total smooth coneflower plants known to exist, is at a North Carolina location proposed for the site of a regional hazardous waste incinerator. Because of these threats, the Service proposed December 9 to list the smooth coneflower as Endangered.

This species, like most other coneflowers, is intolerant of dense shade. Fire or some other suitable form of disturbance, such as well-timed mowing or the careful clearing of trees, is essential to maintaining the glade remnants upon which it depends. Without such periodic disturbance, the habitat is gradually overtaken by shrubs and trees. It is no accident that most of the remaining smooth coneflower populations occur on such open areas as roadsides or utility rights-of-way. Although certain kinds of habitat disturbance are beneficial to the species, it cannot survive repeated mowing at critical stages in its life cycle, bulldozing, or the application of broadleaf herbicides.

Collection of the smooth coneflower for the pharmaceutical trade is a potential threat. For over a century, huge quantities of related coneflower species have been sold in European and American markets under the trade name "Kansas snake root." In Germany alone, more than 280 products made from various American species of coneflowers are registered for medicinal use. Drastic declines in some midwestern coneflower populations have been noted. Although declines in populations of the smooth coneflower from the pharmaceutical trade have not yet been documented, the remaining sites are easily accessible to collectors.

Alabama Streak-sorus Fern (*Thelypteris pilosa* var. *alabamensis*)

This plant, a small, evergreen fern with linear-lanceolate fronds 4 to 8 inches (10 to 20 centimeters) long, is limited to 15 sites along a 3.2- mile (5-km) stretch of the Sipsey Fork, a tributary of the Black Warrior River in northwest Alabama. It takes root in crevices on sandstone ledges, cliff faces, and overhangs that are kept moist by shade and upslope runoff.

The fern's type locality was destroyed by bridge construction and flooding from a downstream dam. About half of the 15 remaining populations are small, consisting of 12 or fewer individuals. They would be threatened by any future dam and road construction on this stretch of the Sipsey Fork. Heavy logging near these sites could alter the fern's environment by decreasing the moisture and increasing the amount of sunlight. Recreational impacts are another concern. The areas in which the fern is found, overhangs and "rockhouses," are frequented by hikers, anglers, and campers. Intentional or incidental damage to the habitat caused by these visitors could jeopardize at least the two largest fern populations. Due to these potential impacts, the Alabama streak-sorus fern was proposed November 29 for listing as Threatened.

Most of the remaining populations are within the Bankhead National Forest. The Forest Service assisted in gathering status information on the Alabama streak-sorus fern, and will work with the Fish and Wildlife Service to conserve populations on the national forest.

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mitment of the administration, to address these disputes in a manner that considers the needs of wildlife in the context of changing water use priorities in two rapidly urbanizing river basins.

Background

The Truckee and Carson River basins lie side by side in west-central Nevada. To the north, the Truckee River flows from Lake Tahoe and terminates at Pyramid Lake. The Carson River rises in the Sierra Nevada south of Lake Tahoe and eventually disappears in the Carson Sink area of the Lahontan Valley (see map). Historically, the two river basins supported over 200,000 acres (80,950 hectares) of wetlands, including Lake Winnemucca, an overflow basin adjacent to Pyramid Lake. The Lahontan Valley alone contained about 85,000 acres (34,400 ha) of wetlands visited by millions of waterfowl and shorebirds using the eastern edge of the Pacific Flyway during migrations.

Pyramid Lake, the ancestral home (and current Reservation) of the Pyramid Lake Paiute Tribe, supports two fish species of cultural and historical importance to the tribe that are now on the Federal list of Endangered and Threatened species. The cui-ui *(Chasmistes cujus),* a unique lake-dwelling sucker found nowhere else, once was an abundant food source. The Lahontan cutthroat trout *(Oncorhynchus clarki henshawii)* was of a strain known to attain upwards of 40 pounds (18 kilograms) and supported a world-class sport fishery. Both species spawned in the Truckee River and require high, cold flows in the spring to reproduce successfully.

At the center of all water use controversies in both river basins is the Newlands Reclamation Project, one of the first Bureau of Reclamation irrigation projects authorized by Congress. Beginning in 1905, water was diverted from the Truckee River at Derby Dam for agricultural uses. In 1915, Lahontan Reser-

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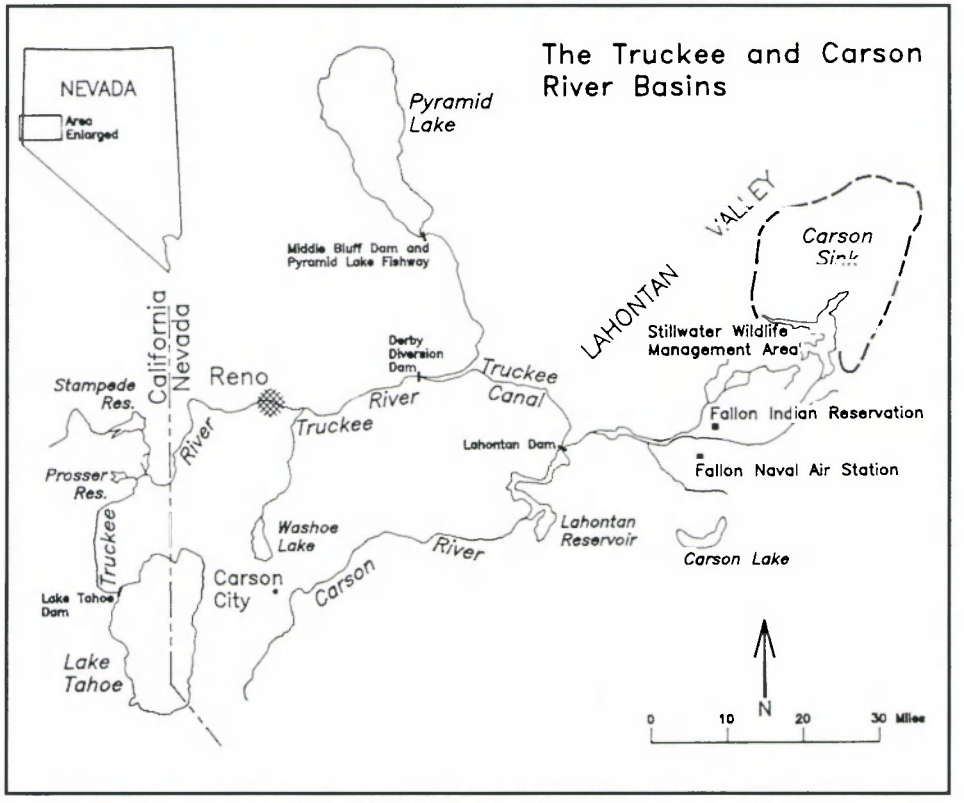

The Truckee and Carson River basins showing Federal facilities of the Washoe and Newlands Projects.

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voir was constructed on the Carson River to serve the project. During many years, nearly half the annual flow of the Truckee River was diverted to Lahontan Reservoir. As a result, Lake Winnemucca disappeared completely and the level of Pyramid Lake fell 80 feet (25 meters), exposing a delta at the mouth of the Truckee River that all but ended upstream migration of the cui-ui and trout. The last spawning run of Pyramid Lake's original Lahontan cutthroat trout population was recorded in 1938, and that population is now extinct. The current population was reestablished in the 1960's from a closely related strain out of nearby Summit Lake. Only the cui-ui's natural longevity (the oldest known individuals may be more than 40 years old) has forestalled a similar fate for that species.

In later years, the Department of the Interior constructed the Marble Bluff Dam and Fishway to assist fish migration over the delta barrier, yet cui-ui still manage only infrequent spawning runs during abnormally wet years. Although the lake is periodically stocked with cui-ui from a Tribal fish hatchery, hatchery-reared fish may not survive to join the adult population. There is no evidence of Lahontan cutthroat trout spawning in the lower Truckee River. Trout are maintained entirely by stocking from hatcheries operated by the Pyramid Lake Tribe and the Fish and Wildlife Service.

Over in the Carson basin, conditions have been equally grim for wetlands. With the advent of the Newlands Project, fresh water that traditionally charged the wetlands was replaced by a greatly diminished supply of agricultural drain water. Overall, wetland acreage in the Lahontan Valley declined by 85 percent. As the area dried, naturally-occurring trace elements—arsenic, boron, lithium, molybdenum, selenium—leached from the soil into the agricultural return flows and accumulated in the shrinking wetlands. Waterfowl deformities, an indicator of trace element toxicity, have been identified and the State of Nevada has issued health warnings against eating waterfowl from the area and fish from Lahontan Reservoir Avian disease, aggravated by overcrowding in the remaining wetlands, has contributed to additional waterfowl losses.

The Stillwater Wildlife Management Area (WMA), including Stillwater National Wildlife Refuge (NWR) and Carson Lake, encompasses the largest remaining body of wetlands in the Lahontan Valley. Historically, the WMA had no non-irrigation water rights. It was supported mostly by agricultural return flows and occasional operational spills of water from Lahontan Reservoir.

These wetlands, though degraded, remain a significant wildlife resource. The valley is a key migration and wintering area for up to 1 million waterfowl, shorebirds, and raptors. Each spring and fall, it hosts a significant percentage of the Pacific Flyway's canvasbacks *(Aythya valisineria),* redheads *(Aythya americana),* tundra swans *(Cygnus columbianus),* gadwalls *(Anas strepera),* northern shovelers *(Anas clypeata),* green-wing teals *(Anas crecca),* and ruddy ducks *(Oxyura jamaicensis),* along with the largest breeding colony of white-faced ibis *(Plegadis chihi)* in North America. Endangered birds also use the area. Up to 70 bald eagles *(Haliaeetus leucocephalus),* Nevada's largest concentration, winter in the valley and American peregrine falcons *(Falco peregrinus anatum)* are known to visit.

The Lahontan Valley wetland system was named to the Western Hemisphere Shorebird Reserve Network in 1988, and it has been nominated for inclusion under the Convention on Wetlands of International Importance, attesting to the continental significance of this resource. Because it is one of only three large interior basin wetland systems along the west coast, deterioration of Lahontan Valley wetlands has already markedly reduced the carrying capacity of the Pacific Flyway.

In recent years, litigation on behalf of the Pyramid Lake Paiute Tribe has emphasized the Indian Trust responsibilities of the Secretary of the Interior and the Federal obligation to recover listed Pyramid Lake fishes. A combination of court actions and Secretarial initiatives over the years has increased the efficient use of wa-

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ter on the Newlands Project, reduced diversions from the Truckee River, and limited the spills from Lahontan Reservoir. While benefitting Pyramid Lake's listed fishes by leaving more water in the Truckee River, the consequent reduction of agricultural return flows to the Lahontan Valley has severely reduced wetland acreage. In addition, new and more restrictive operating criteria for the Newlands Project, adopted in 1988, promise to reduce Truckee diversions further, with an inevitable loss of additional wetlands.

Wetland Restoration

In all, there is a significant potential for serious wildlife losses in the Lahontan Valley unless sufficient quantities of water are obtained. To address this pending crisis, P.L. 101-618 directs the Secretary of the Interior to acquire enough water to sustain, on a long-term average, approximately 25,000 acres (10,120 ha) of wetlands in the Lahontan Valley. This is the approximate wetland acreage that remained on the managed wildlife areas after Newlands Project operations began early in this century and is considered a reasonable goal. Water may be acquired by a variety of means, including donations or exchanges, but purchases must be from willing sellers.

Because it takes as much as 5 acre-feet of water to sustain 1 acre of wetlands in western Nevada, the Service will need to secure up to 125,000 acre-feet of water to achieve this legislative goal. In a normal year, the Lahontan Valley wetlands will receive 60-70,000 acre-feet of agricultural water of acceptable quality from the Newlands Project. Under this assumption, the Service will need to acquire about 55,000 acre-feet of additional agricultural water rights. The Fish and Wildlife Service believes there is enough water currently available from willing sellers to meet the mandated wetland goal. Experience so far indicates that acquisition costs will be about $400 to $500 per acre-foot of water.

The wetland restoration envisioned by Congress obviously will take time and money. According to the General Accounting Office, $50 million will eventually be required. The Service has already spent $2.7 million to purchase about 6,000 acre-feet of water rights for the refuge. The Service's fiscal year 1991 budget included $4.0 million for water purchases, and there is another $4.0 million in the budget for fiscal year 1992. Under the new law, the State of Nevada is to contribute at least $9 million toward water rights purchases or other protective measures to benefit wetlands.

The new law requires that all water acquisitions and transfers be consistent with State water law. The Service does not dispute legitimate irrigation entitlements to water-righted lands, and no one will be forced to sell or otherwise relinquish a water right. The Service is committed to ensuring that transfers of water rights will not increase Truckee River diversions.

To generate additional non-Federal funding, the law establishes the Lahontan Valley and Pyramid Lake Fish and Wildlife Fund to receive and hold State money, private donations, and other receipts. The fund will be used to benefit both the listed Pyramid Lake fishes and the Lahontan Valley wetlands, providing an opportunity for private groups and citizens to assist directly in the long-term conservation and management of wetlands and endangered species.

The Nevada Waterfowl Association and The Nature Conservancy are also cooperating in efforts to restore Lahontan Valley wetlands in concert with the implementation of P.L. 101-618. The first "new" water turned onto the refuge in June 1990 was acquired by The Nature Conservancy from Newlands farmers and donated to the Service. The Service is awaiting the approval of the Nevada State Engineer before remaining water rights acquired to date can be transferred to the refuge.

Contaminated Drain Water

Pollution by contaminated drain water is another significant problem that must be corrected to ensure the long-term survival of the Lahontan Valley wetlands. The TJ Drain provides subsurface drainage for portions of the Fallon Paiute Shoshone Reservation near Fallon, Nevada, and empties into the WMA. Drain water from these lands is extremely toxic to fish and invertebrates, and it is increasing the salinity of dwindling Stillwater wetlands to unacceptable levels.

The new law directs the Secretary to develop and implement, in consultation with the Fallon Tribe, a plan for closure of the TJ Drain. The government will provide substitute drainage and bear all costs of the drain closure. In addition, the Service intends to close the Hunter Drain, which is primarily on the Stillwater NWR. Closure of these drain systems will not significantly reduce the total volume of return flows to the refuge, but will eliminate significant sources of trace element and salinity pollution.

Pyramid Lake Fishes

Just as it addresses wetland restoration, P.L. 101-618 pursues the recovery of listed fishes in Pyramid Lake. In perhaps the most significant provision for these species, the Secretary is directed to negotiate a formal Operating Agreement with the States of California and Nevada to govern management of the Truckee River reservoirs. Among other purposes, such an agreement would seek to improve spawning conditions in the lower river through coordinated reservoir operations. The Secretary is authorized to negotiate agreements for storage of non-Federal water in the Federal facilities of the upper Truckee River basin, for which he will collect reasonable charges. These fees will offset Federal reservoir operation costs, with remaining receipts to be deposited in the Lahontan Valley and Pyramid Lake Fish and Wildlife Fund.

The law requires that, subject to any final Operating Agreement, Federal water in two Federal reservoirs in the upper Truckee basin—Stampede and Prosser Creek Reservoirs—will be committed to recovery of the listed fishes in Pyramid

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Lake. Prior to the passage of P.L. 101-618, only the storage of Stampede Reservoir had been dedicated for that purpose. Coordinated operations of the two reservoirs, in conjunction with other storage facilities, should provide an improved water regime in the Truckee River for cui-ui and trout. Recovery of the cui-ui, in particular, will be enhanced if more frequent and successful spawning runs occur. This would create a more balanced age-class structure within the Pyramid Lake population.

In seeking to further reduce the diversion of Truckee River water, the law directs the Secretary to report on the feasibility of achieving 75 percent efficiency in the use of Newlands Project water. (The average project efficiency from 1981-85 was 55 percent.) The State of Nevada is to support this effort with $4 million for water conservation measures on the Newlands Project, and the Federal Government is authorized to match the State contribution.

The U.S. Navy uses about 10,000 acre-feet of Newlands Project water in an agriculture program at Fallon Naval Air Station that aids in fire and dust control. This diversion is to be reduced, to the maximum extent practicable, through implementation of new land management plans that will test the feasibility of using arid-climate grasses and shrubs for soil stabilization. Although the safety of operations at the Air Station is paramount, any water that can be saved is to be managed by the Secretary for the benefit of Pyramid Lake fishes and Lahontan Valley wetlands. Water made available from the Air Station would help to offset reduced Truckee River diversions.

As an additional conservation measure, the Secretary is directed to recoup irrigation water that was previously diverted from the Truckee River in excess of Newlands Project entitlements. The Bureau of Reclamation has made a preliminary estimate of about 825,000 acre-feet of illegal diversions over the years. It is somewhat problematical how water diverted long ago would be effectively recaptured, but the Secretary expects to pursue the claim to this water, which could be used to benefit Pyramid Lake.

P.L. 101-618 also provides explicit authority for the acquisition of water and water rights to benefit Pyramid Lake's listed fishes. Again, the willing seller provisions will apply. In addition, improvements deriving from the Operating Agreement, dedication of Prosser Reservoir storage, and recoupment of prior over-diversions will contribute to recovery of the listed fishes.

In an ironic twist, Pyramid Lake fishes in the Truckee Basin will finally *benefit* from the acquisition of water for wetlands in the Carson Basin. Pursuant to past court decrees, the conversion of water from agriculture to wetland use will occur at less than the full irrigation entitlement. Therefore, a portion of each acre-foot purchased for Lahontan Valley wetlands will, on average, remain in the Truckee River and flow on into Pyramid lake.

Finally, the Fish and Wildlife Service is moving expeditiously to complete recovery plans for both Pyramid Lake fishes in order to capitalize on all of the recovery features of the new law. With the new interest in this entire issue, the Service expects an enthusiastic public response to its planning efforts.

Conclusion

It would be a mistake to construe these issues as pitting waterfowl against endangered species. The Service need not, and will not, trade off one resource against the other in a win-lose struggle for available water. Compensated transfers of water from agriculture can resolve the needs of both waterfowl *and* endangered species without adversely affecting other legitimate interests in the Truckee and Carson River basins.

No single piece of legislation can resolve all of the outstanding water issues that have plagued western Nevada for most of this century; however, from the standpoint of wildlife resources, the new law addresses the most significant threats to endangered species and wetlands in the Lahontan Valley. Ultimate success, however, can only be achieved through a cooperative effort that involves Federal, State and local governments, the Pyramid Lake and Fallon Tribes, and affected private interests. Perhaps the creativity and spirit of compromise that resulted in P.L. 101-618 will encourage the resolution of conflicts elsewhere in the Nation that seem unyielding.

Editor's note: Ralph Swanson served as a Fish and Wildlife Service representative on the Departmental task force that developed the administration's recommendations on P.L. 101-618. The bill was authored by Senator Harry Reid of Nevada and was supported by the Nevada congressional delegation and local citizen's groups.

Regional News

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west of Austin, when the whooper was shot. The bird was one of a flock of five that were beginning the long journey from their wintering grounds at Aransas National Wildlife Refuge on the Gulf Coast of Texas to their nesting grounds in northern Canada. The adult female was one of only 33 breeding females in an estimated wild population of about 140 whooping cranes.

Texas Parks and Wildlife Department Game Warden Jack Reynolds discovered the whooper after investigating a tip from Roena Wharton of Bend, Texas. She reported to State Warden Reynolds that she had spotted the five birds flying near the river, heard shots, and saw three of the birds fly away. However, only one carcass was found buried in a shallow grave near the river, and it is believed the other bird successfully escaped. On November 7, Roena Wharton was presented a $7,500 reward by Mike Spear, the Service's Southwest Regional Director, for providing information leading to the convictions.

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Eight Species Added to List of Endangered and Threatened Species in November/December 1991

Final rules listing eight species — seven plants and one animal — as Endangered or Threatened were published in November/December 1991. Endangered Species Act protection now applies to the following:

PLANTS

Three California annuals - all Endangered (F. R. 12/2/91)

- **Sonoma sunshine or Baker's stickyseed** *(Blennosperma bakeri)* and
- **Burke's goldfields** *(Lasthenia burkei)* - small herbs in the sunflower family (Asteraceae) that bear yellow flowers. They occur in vernal pools and swales of the Cotati Valley in Sonoma County. Sonoma sunshine has also been reported from the adjacent Sonoma Valley. Burke's goldfields has been reported from Manning Flat and Steurmer Winery in Lake County and historically from Ukiah in Mendocino County.
- **Sebastopol meadowfoam** *(Limnanthes vinculans)* - A multi-stemmed member of the false mermaid family (Limnanthaceae), this plant produces white flowers. Like the two herbs listed above, it is located in the vernal pools and swales of the Cotati Valley of Sonoma County, California.
- **Cumberland rosemary** *(Conradina verticillata)* - A perennial in the mint family (Lamiaceae), this species grows along the banks of the Big South Fork Cumberland River, the Obed River, and the Caney Fork River in north-central Tennessee and adjacent Kentucky; Threatened (E R. 11/29/91).

Little Aguja pondweed *(Pota-mogeton clystocarpus)* - This aquatic plant, a member of the pondweed family (Potamogetonaceae), is located in an intermittent stream at a single site, Little Aguja Canyon, in the Davis Mountains of southwest Texas (Jeff Davis County). It has branched, slender stems, linear leaves, and short, cylindrical flower spikes; Endangered (E R. 11/14/91).

Two Endemic Puerto Rico Orchids - both Endangered (F.R. 11/29/91)

- *Lepanthes eltorensis* and
- *Cranichis ricartii* are small orchids with a restricted geographic distribution; the former to the eastern part of the island, the latter to the western part.

ANIMALS

Point Arena mountain beaver *(Aplodontia rufa nigra)* - This mammal, which is different in appearance from the flat-tailed rodent most people think of as the "true" beaver *(Castor canadensis),* has small eyes, rounded ears, and a distinctive stump of a tail. Its known distribution is limited to a small portion of coastal Mendocino County, California; Endangered (F. R. 12/12/91).

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Seventy-six miles (122 km) of the Niobrara River in Nebraska have been designated a federally protected scenic river. Passage of the Niobrara Scenic River Designation Act added this section to the Wild and Scenic River System. Another 25 miles (40 km) of the Niobrara received a degree of protection nearly as high when it was designated a recreational river. The Niobrara is also being studied as a potential national park. This river is a migration stopover for migrating whooping cranes, and the new designations will ensure protection of their habitat. The recreational segment of the river is just upstream of its confluence with the Missouri River. The scenic river segment begins just northeast of the town of Valentine and runs downstream 82 miles (132 km). A 6-mile (9.5-km) segment between Chimney Creek and Rock Creek is currently excluded but will automatically be added within 5 years if Congress does not appropriate funds for construction of a water project on that segment.

* * *

Mitchell Energy and Development Corporation (a natural gas, natural gas liquids, and oil producer) has used dredge material to create marsh habitat for whooping cranes along the south Texas coast. Designed to help replace habitat previously lost to erosion, the project is located in the Mesquite Bay area of Aransas National Wildlife Refuge adjacent to Bludworth Island. The man-made 15-acre (6-ha) marsh is enclosed by a dike that is protected from erosion on three sides by interlocking mesh concrete matting. Service staff from Aransas Refuge have guided the project, which was approved by the Texas General Land Office, Texas Parks and Wildlife Department, U.S. Army Corps Engineers, National Marine Fisheries Service, and U.S. Environmental Protection Agency. The project is a test of how effectively dredge material can be used to create new wetland environments for whooping cranes and other coastal wildlife.

The Service approved creating the marsh as one means of replacing whooping crane habitat lost to erosion and as mitigation for dredging that Mitchell Corporation needed to gain access to a well site in Mesquite Bay. The habitat was constructed in three stages. Bottom soil at the site was used to build a rectangular levee creating the island perimeter. The levee was then filled with 65,000 cubic yards of dredge material from the access channel being built next to the well site. The concrete mats were placed on the outside banks of the levee. In spring, the area will be planted with native marsh vegetation to duplicate the whooping crane's preferred environment.

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Region 4 - The known range of the Louisiana pearlshell *(Margaritifera hembeli),* an Endangered freshwater

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mussel, has been expanded into the Red River drainage in Louisiana. In 1988, when the species was listed, its known range was restricted to the Bayou Boeuf drainage in Rapides Parish, Louisiana. The Bayou Boeuf drainage is south of the Red River drainage and enters the Gulf of Mexico in Vermilion Bay. The Red River flows into the Mississippi River.

Although these two systems are normally separate, there is a possible connection between the tributaries of Bayou Boeuf and Bayou Rapides (part of the Red River drainage) during high floods. These flows may enable host fish to expand the pearlshell's range by transporting the glochidea (mussel larvae that parasitize a host fish) between drainages.

Based upon a report of the Louisiana pearlshell from Moccasin Branch in the Red River drainage, biologists from the Service's Jackson, Mississippi, Field Office, Louisiana Department of Wildlife and Fisheries, and Kisatchie National Forest (Forest) conducted a field survey of streams in and adjacent to the Catahoula District of the Forest last fall. They found 12 populations of the Louisiana pearlshell in three small drainages that eventually flow into the Red River. One drainage is isolated from the others by the impoundment of Lake Latt. All of the populations were in small, shallow, clear streams with gravel or firm sand substrate. Rarely were any other mussel species present, and only the little spectaclecase *(Villosa lienosa)* and the Wabash pigtoe *(Fusconaia flava)* occurred together. The typical streams where the Louisiana pearshell was found are not generally considered to be good mussel habitat because of their small size. Biologists searched 13 other streams in the vicinity without finding the Louisiana pearlshell. Biologists with the Service, the Louisiana Department of Wildlife and Fisheries, and the Forest will survey many small streams in the Red River drainage. Upon completing these surveys, the Service will review the status of the Louisiana pearlshell to determine if its Endangered classification is still warranted.

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As a result of surveys initiated last summer, the Georgia Department of Natural Resources (GADNR) has discovered seven populations of a Threatened plant, the Mohr's Barbara's buttons *(Marshallia mohrii)*. These populations, discovered in Floyd County, Georgia, mark the first documented occurrence of the plant in that State since the early 1900's. The newly discovered populations range in size from 17 to 300 plants. There are now a total of 22 known sites for the species, including the 15 populations in Alabama. GADNR is continuing its surveys and will focus on trying to relocate the historic population in Walker County, Georgia.

* * *

Region 5 - Region 5 conducted a workshop on section 7 of the Endangered Species Act for several northeastern field offices of the U.S. Army Corps of Engineers (COE). Staff from the Service's regional, field, and Washington offices shared their expertise on the agenda topics, which included listing, recovery, Critical Habitat, and section 7 interagency consultation procedures. The workshop was an excellent forum for reviewing and discussing past section 7 consultations and how the resulting decisions were made.

In a similar effort, endangered species specialists from the Service's New England Field Office teamed up with biologists from the Gloucester, Massachusetts, office of the National Marine Fisheries Service for an Endangered Species Act training session at the COE New England divisional office in Waltham, Massachusetts.

* * *

Recent field work in Pennsylvania led to the discovery of two new populations of rare plant species. A population of eared false foxglove *(Tomanthera auriculata)*, a candidate for listing under the Endangered Species Act, was found in Bucks County at a Superfund cleanup site. This is the second known occurrence of the species in Pennsylvania. In Dauphin County, a fourth Pennsylvania population of northeastern bulrush *(Scirpus ancistrochaetus)* was found on State land.

* * *

Region 6 - State and Federal biologists have undertaken genetic and morphology studies to determine the taxonomic status and distribution of several closely related members of the genus *Gila*, including the Endangered humpback chub *(Gila cypha)* and bonytail chub *(Gila elegans)*, in the Colorado River Basin. Field sampling will continue through 1993 and a final report is expected in 1994.

The Bureau of Reclamation agreed to release an additional 10,000 acre-feet of water into the Colorado River each year on an as-available basis from Reudi Reservoir in western Colorado. These releases are expected to improve the late summer and fall habitat conditions for the Endangered Colorado squawfish *(Ptychocheilus lucius)* and razorback sucker *(Xyrauchen texanus)* in an important 15-mile (24-km) stretch of river between Palisade and Grand Junction, Colorado.

Razorback suckers were once widespread throughout most of the Colorado River system from Wyoming to Mexico. Dikes formed along riverbanks to prevent flooding into farmland have eliminated protected backwaters and pools believed to be used by razorback suckers during spawning. The loss of these backwaters, in addition to competition with 41 species of introduced fishes and the modified flows from numerous dams and diversions, has resulted in the decline of razorback suckers and some other native Colorado River fish. Nearly all the razorback suckers found in the wild are believed to be more than 30 years old and were hatched before most of the dams and diversions in the Colorado River system were built. No one knows how long these fish will live, but they are likely to die in the next 5 to 15 years.

There are now 33 wild adult razorback suckers in captivity. These fish will be placed in protected ponds and will be used to establish a broodstock for research on the species'

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recovery. A small number of fish produced from these adults will be restocked into the Colorado River to test their ability to survive in the wild.

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Region 7 - Biologists surveying nesting Arctic and American peregrine falcons *(Falco peregrinus tundrius* and *Falco peregrinus anatum)* in Alaska last spring and summer located 313 pairs of the birds defending territories in the interior and northern parts of the State.

Private citizens joined biologists from the Fish and Wildlife Service, Bureau of Land Management, National Park Service, and Alaska Department of Fish and Game in searching for peregrines along 2,485 miles (4000 km) of rivers and coastlines. Raptor experts from Arizona, California, Colorado, Idaho, and Utah also participated in the surveys, and biologist Dr. Albinas Shalnar assisted on the Yukon River as part of the Service's technical exchange program with the former Soviet Union.

Population size continues to increase about 10 percent each year in most areas, and reproduction appears to be unimpaired by environmental contaminants. The 313 pairs raised about 500 young, 377 of which were banded for studies on migration, survival, dispersal, and nest site fidelity.

While conducting the 1991 nesting surveys, Service biologists collected unhatched eggs to continue an analysis of DDE residues. Levels of DDE, a breakdown product of the pesticide DDT that causes eggshell thinning in peregrines, decreased about 50 percent between 1984 and 1989.

BOX SCORE
LISTINGS AND RECOVERY PLANS

Category	ENDANGERED U.S.	ENDANGERED Foreign Only	THREATENED U.S.	THREATENED Foreign Only	LISTED SPECIES TOTAL	SPECIES WITH PLANS
Mammals	56	249	9	22	336	33
Birds	73	153	12	0	238	69
Reptiles	16	64	18	14	112	27
Amphibians	6	8	5	0	19	7
Fishes	55	11	36	0	102	53
Snails	7	1	6	0	14	7
Clams	40	2	2	0	44	36
Crustaceans	8	0	2	0	10	5
Insects	13	1	9	0	23	13
Arachnids	3	0	0	0	3	0
Plants	271	1	70	2	344	139
TOTAL	548	490	169	38	1245*	389**

Total U.S. Endangered	548	(277 animals, 271 plants)
Total U.S. Threatened	169	(99 animals, 70 plants)
Total U.S. Listed	717	(376 animals, 341 plants)

* Seperate populations of a species that are listed both as Endangered and Threatened are tallied twice. Those species are the leopard, gray wolf, grizzly bear, bald eagle, piping plover, roseate tern, Nile crocodile, green sea turtle, and olive ridley sea turtle. For the purposes of the Endangered Species Act, the term "species" can mean a species, subspecies, or distinct vertebrate population. Several entries also represent entire genera or even families.

** There are 317 approved recovery plans. Some recovery plans cover more than one species, and a few species have seperate plans covering different parts of their ranges. Recovery plans are drawn up only for listed species that occur in the United States.

Number of Cooperative Agreements signed with States and Territories:	53 fish & wildlife 39 plants
Number of Cooperative Grant Agreements signed for the African Elephant Conservation Act:	7
Number of CITES Party Nations:	112

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ENDANGERED SPECIES

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